

Automated Efficiency Meter

User's Manual

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Connecting the Hardware

The first step in using the Automated Efficiency Meter (AEM) is to properly connect the hardware. This manual will go through a step-by-step procedure to properly show you how to connect your device to obtain accurate efficiency measurements.

Step 1: Connect the sma jack and 3 pin connector labeled VOUT1 to your sma connector and 3 pin header labeled VOUT1 as seen in figure 1:

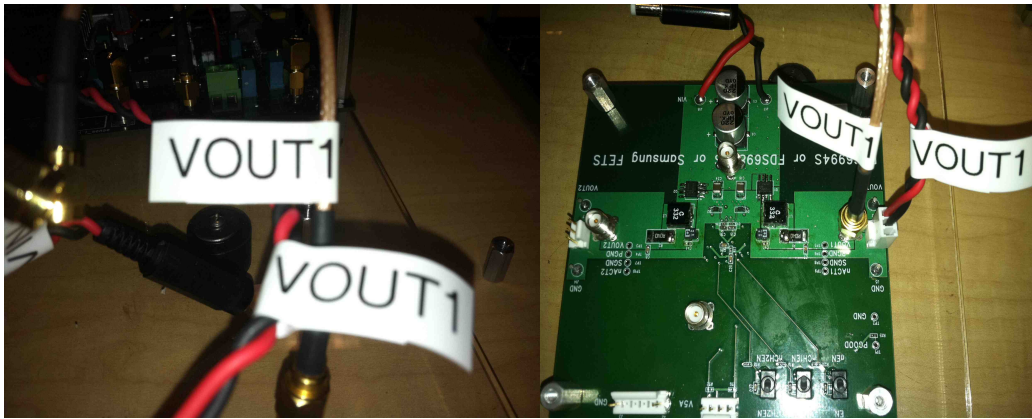


Figure 1.

Step 2: Connect the sma jack and 3 pin connector labeled VOUT2 to your sma connector and 3 pin header labeled VOUT2 as seen in figure 2:

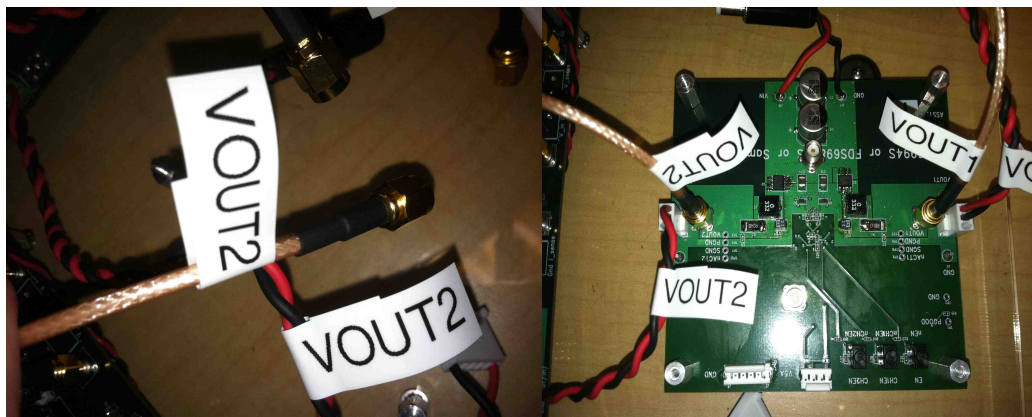


Figure 2.

Step 3: Connect the sma jack and 6 pin connector labeled V5A to your sma connector and 6 pin header labeled V5A as seen in figure 3:

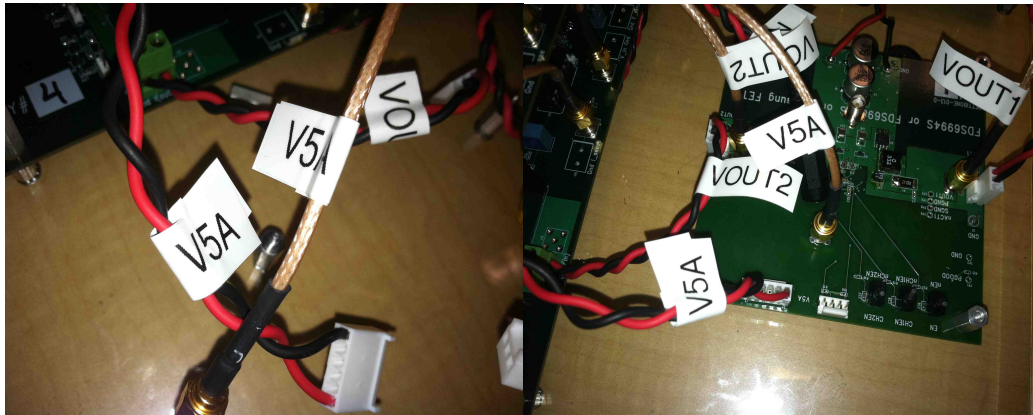


Figure 3.

Step 4: Connect the sma jack and power plug labeled VIN to your sma connector and power plug labeled VIN as seen in figure 4:

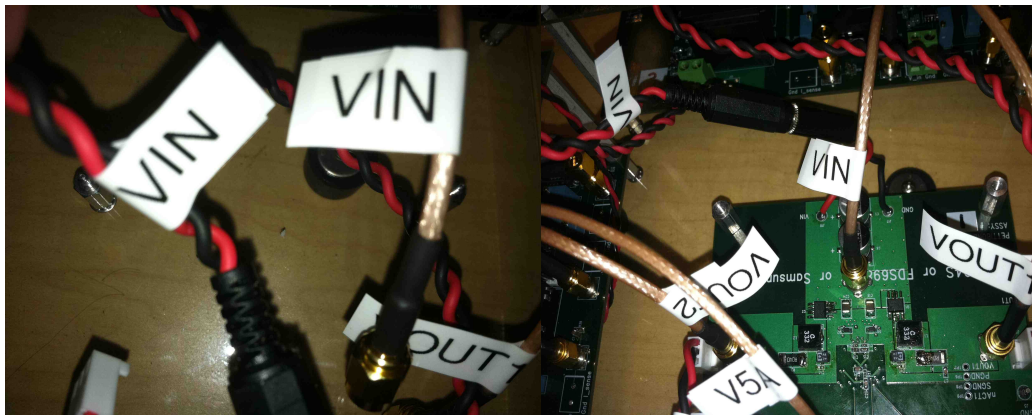


Figure 4.

Before you move onto the software section, double check all of your connections. Your final product should look like Figure 5.

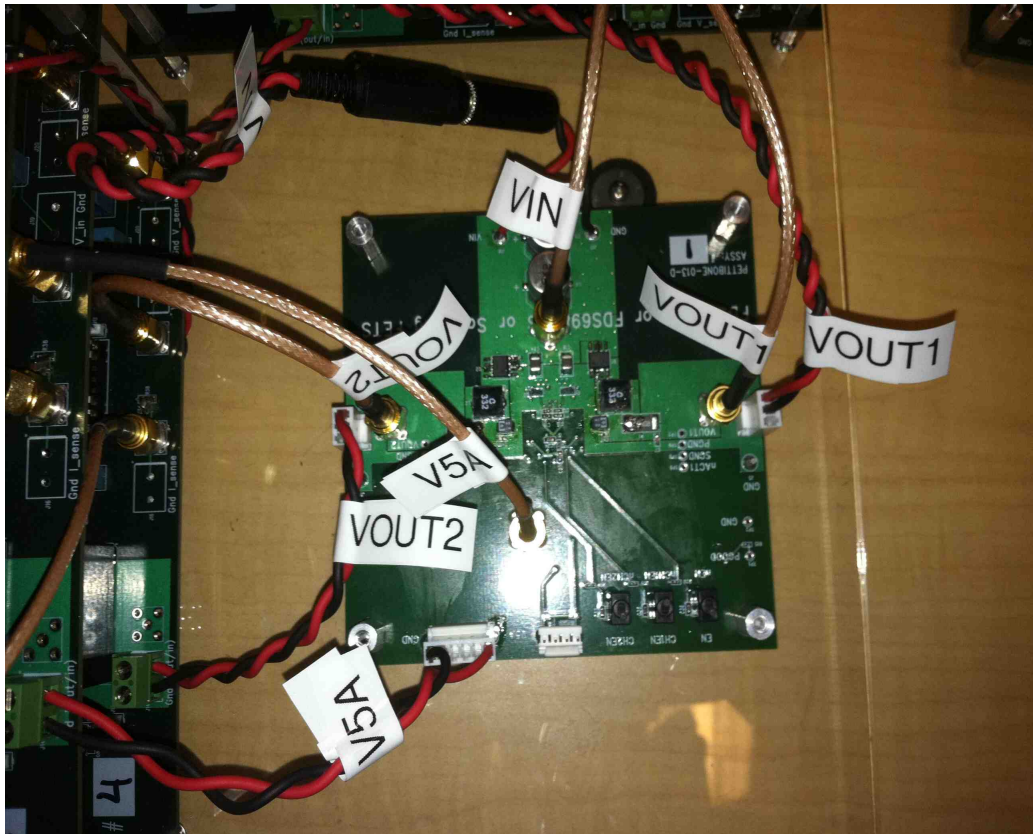


Figure 5.

Installing the Software

The user-interface for the Automated Efficiency Meter requires a few different software installations. In this section we will walk through everything that needs to be installed. It is important that you install the correct version of all of these software programs or else you may get unexpected errors.

Installing Python: Go to www.python.org/download/releases/2.7.1/ and scroll down the page to the download section. Select the correct download that meets your operating system requirements. After you have installed python open a command line and type “python --version”. You should read back “Python 2.7” and your command prompt should look something like Figure 6. If you get some type of an error, then something went wrong in the installation. Try reinstalling it and make sure you are installing the correct download for your operating system.



Figure 6.

Installing Pywin32: This section is for windows operating systems only. Go to www.sourceforge.net/projects/pywin32/files/pywin32/Build216/ and select [pywin32-216.win32-py2.7.exe](#). This will install correctly if you have installed the correct version of python. If you have not installed the correct version of python you will get some type of error saying “Cannot find Python in registry”. If you get this error you need to reinstall Python 2.7.1.

Installing Pyserial: Go to www.sourceforge.net/projects/pyserial/files/pyserial/2.5/ and select the correct pyserial download for your operating system. This will install correctly if you have installed the correct version of python. If you have not installed the correct version of python you will get some type of error saying “Cannot find Python in registry”. If you get this error you need to reinstall Python 2.7.1. Yes, the same exact error as pywin32.

Installing WxPython: Go to www.wxpython.org/download.php and select the correct wxpython2.9 download for your operating system. Make sure the wxpython2.9 download is for python 2.7. It should say somewhere on the download link “py27”. For example [wxPython2.9-win32-py27](#). Follow the installation procedure and if you have any errors like the registry errors from pyserial and pywin32 then you once again have installed the wrong version of python.

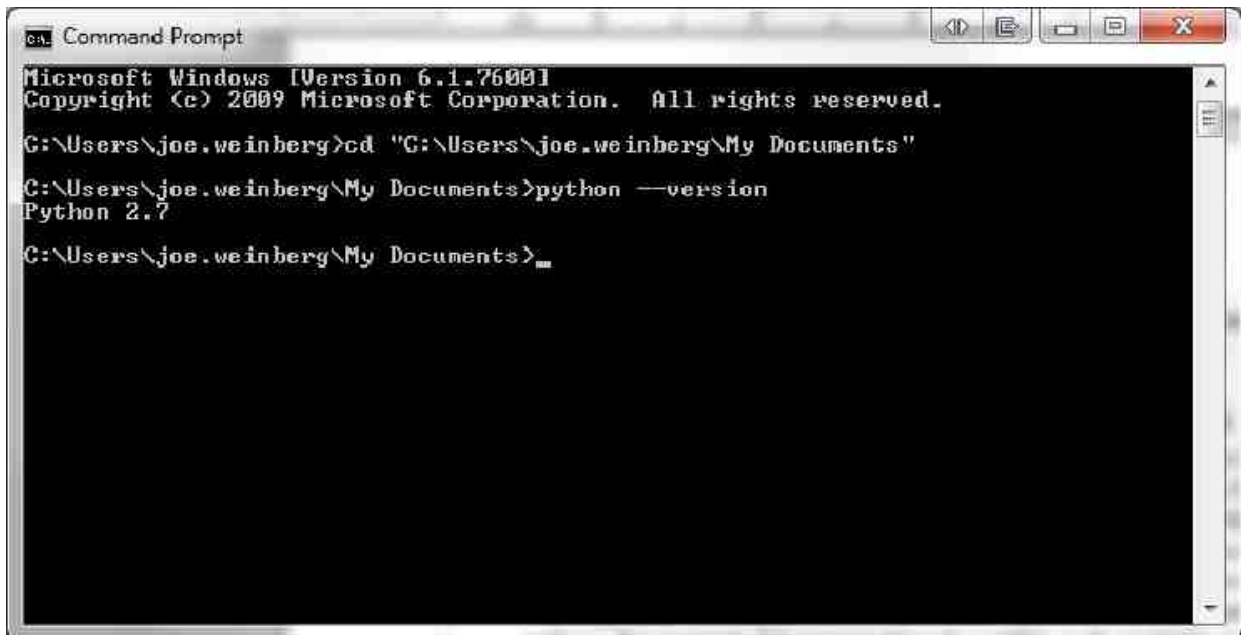
Installing Matplotlib:

Go to www.sourceforge.net/projects/matplotlib/files/matplotlib/matplotlib-1.0.1/ and select the correct matplotlib download for your operating system. Make sure the

matplotlib download is for python 2.7. It should say somewhere on the download link “py2.7”. For example [matplotlib-1.0.1.win32-py2.7.exe](#). If you have installed everything successfully without any errors then you are ready to move on to the next section. If you have had errors and have not fixed them, then you need to fix these errors otherwise you will not be able to access the user-interface.

Taking Efficiency Measurements

Before taking any efficiency measurements we first need to add the Automated Efficiency Meter python script to your computer. It should be on a CD that came with the Automated Efficiency Meter. If you can not find the python script, then please e-mail Joe at joe.weinberg@packetdigital.com and he will send you a compressed zipped folder containing the python script. Once you have obtained a copy of the folder titled “AEM_python”, then place this folder somewhere on your computer that recognizes python. For example if I want to place the “AEM_python” folder in “My Documents”, then I should check to make sure “My Documents” recognizes python. To do this open a command line and type “cd C:\Users\joe.weinberg\My Documents” and press enter. This changes the directory to My Documents and notice that this is a specific address for me. Your address will be different. To find exactly what the address is open up the destination you wish to place the “AEM_python” folder in and copy that address into the command line. Now type python “--version”. You should read back “Python 2.7”. If you read back some kind of error and you are sure you have python installed correctly, then Python is not recognized in that directory which means you must save the “AEM_python” folder elsewhere. Usually you can save the folder anywhere on your hard drive without any problems, but I am putting this in here just to save you hours of troubleshooting if you can't get the python script to open. Figure 7 illustrates how to check for python from the command line.



```
ca. Command Prompt
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\joe.weinberg>cd "C:\Users\joe.weinberg\My Documents"
C:\Users\joe.weinberg\My Documents>python --version
Python 2.7
C:\Users\joe.weinberg\My Documents>_
```

Figure 7.

Now we are ready to open up the AEM python script. To do this go back to the command line and type “cd (insert your file destination here)\AEM_python\gui” and press enter. Next type “python eff_gui.py” and press enter. The Automated Efficiency Meter GUI should come up on the screen. If it did not, then once again you have made a mistake somewhere. Your user-interface should look like Figure 8.

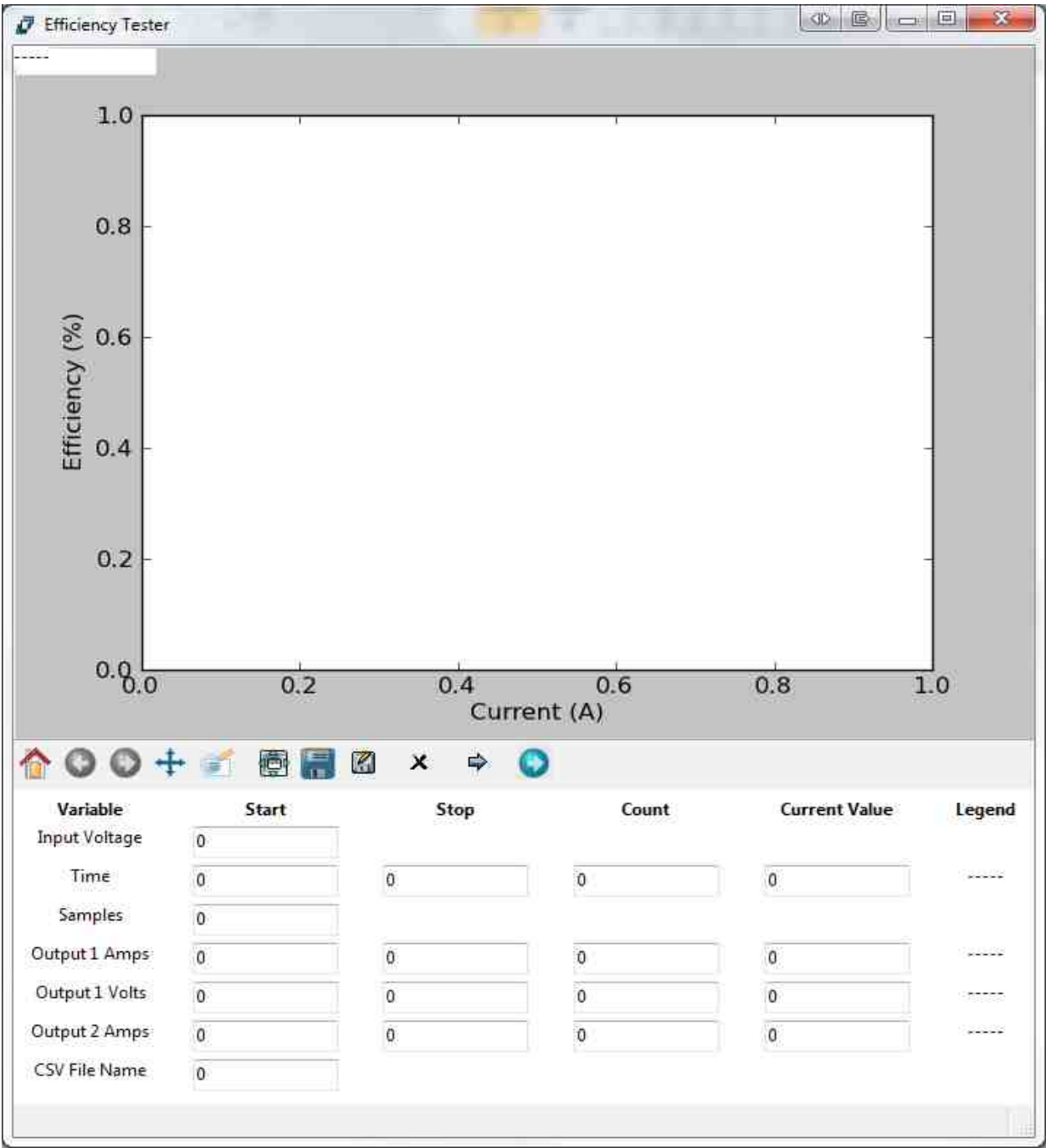


Figure 8.

Now taking the test is simple. Just type in the Input Voltage, Samples, and the current range you wish to measure over. Now click the run arrow. An example is illustrated in Figure 9.

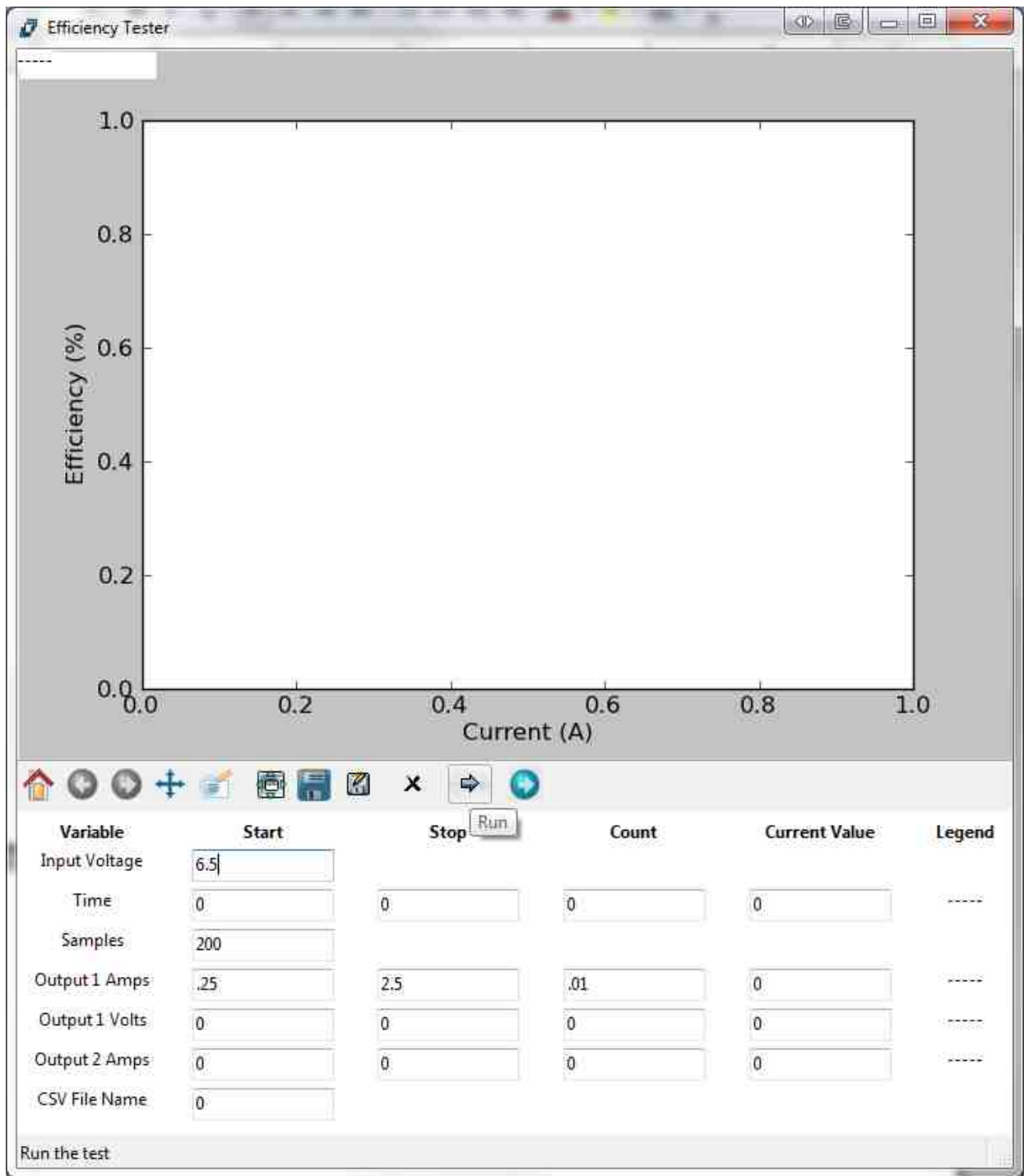


Figure 9.

You have now completed the installation process for the Automated Efficiency Meter.
So enjoy all of the wonderful benefits the Automated Efficiency Meter has to offer.